

Understanding the Community Based Participatory Research (CBPR) Approach:
Case Study in Ghana

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Introduction

In 2003, the University of Utah, in cooperation with Kwame Nkrumah University of Science and Technology (KNUST), Komfo Anokye Teaching Hospital (KATH), the Atwima Nwabiagya District Assembly and Barekuma community leaders, formed what is known as the Barekuma Collaborative Community Development Project (BCCDP) in Ghana, West Africa. In 2009, the BCCDP facilitated the establishment of a farmer's cooperative in the village of Barekuma, outside of Kumasi, Ghana, which is called the Amakye-Bare Youth Co-operative Farming & Marketing Society Limited. Research performed in the summer of 2011 measured the perceptions of the members of the Agricultural Cooperative toward the BCCDP. Using Community-Based Participatory Research (CBPR), this paper describes the BCCDP, the Agricultural Cooperative, and Ghanaian culture, while expanding upon the perceptions of Agriculture Cooperative members regarding concepts of loans and ownership, and concludes with recommendations for improvement.

CBPR is an approach for community-engaged research that promotes equitable partnerships between researchers and community members (Wallerstein & Duran, 2003). CBPR seeks to integrate researchers and communities in shared decision-making and ownership in order to promote social change and eliminate health disparities (de Schweinitz et al., 2009). Equitable partnerships require sharing power, resources, credit, results, and knowledge, as well as a reciprocal appreciation of each partner's knowledge and skills at each stage of the project, including problem definition/issue selection, research design, conducting research, interpreting the results, and determining how the results should be utilized for community development (Amuase, 2011). Because of the potential of CBPR to reduce health disparities, the Institute of

Medicine considers CBPR one of eight priority approaches for public health education in the twenty-first century (Israel, 2005).

CBPR is at the heart of all of the projects undertaken by the BCCDP. Every autumn, leaders from Barekuma, University of Utah, KATH, and KNUST meet to discuss potential research projects for the coming summer, along with needed follow up to past projects. Projects undertaken undergo scrutinized research beforehand to determine the best methods for not only conducting the research, but also using validated tools whenever possible. They are only carried out after receiving approval from both the University of Utah Institutional Review Board (IRB) and the IRB at Kwame Nkrumah University of Science and Technology and Komfo Anokye Teaching Hospital.

Background

History of the BCCDP

In the late 1990s, Barekuma was identified as a community with high risk for Schistosomiasis (de Schweinitz et al., 2009). Local community leaders, the University of Utah, Kwame Nkrumah University of Science and Technology (KNUST), Komfo Anokye Teaching Hospital (KATH) and the local District Health Office came together to find the causes of Schistosomiasis in this region. The partnership that resulted from this effort, formed in 2003, is called the Barekuma Collaborative Community Development Project (BCCDP). The BCCDP, in addition to building schools, new water treatment and sanitation facilities, and conducting tests for malaria, has also been a research consortium where faculty and students of KNUST, KATH, and the University of Utah propose research projects to be carried out over a three-week

period in July. Research from these projects is analyzed following the trip. Results from research projects are presented to the community the following year in an effort to improve health and advance the community.

Theorists have linked economic development to health. In a study on microfinance in Indonesia, Dr. DeLoach and Dr. Lamanna find there is a link between development and child health outcomes. Specifically they find communities with microfinance industries have better health than those that do not (DeLoach & Lamanna, 2011). The BCCDP has done some economic development projects with the goal of improving health outcomes through development. The BCCDP undertakes a significant portion of health related research ranging from water quality to best contraceptive practices. In order to understand the complexities of undertaking a collaborative project within Ghana, one must know more about the Ghanaians and their systems for land ownership, chieftaincy, loans, and other cultural facts.

Though Ghana is a former British Colony and affirms English as its primary language, there is a lack of consensus regarding the amount of ethnic languages spoken, which is thought to be somewhere between 38 and 47. The people of Barekuma are primarily of the ethnic group of Akan. The Akan chiefs have several lower divisions of lesser chiefs and the people of Barekuma are ruled by the national chief (Akan), the regional chief (Asante), a community chief (Bantama), and then local municipal elders (Barekuma). There is also a separate national government which is a constitutional democracy (C.I.A., 2011). Local chiefs, however, remain vital leaders in both rural and cosmopolitan Ghana (Odotei & Awedoba, 2006).

The Barekuma community is within the Atwima Nwabiagya district of the Ashanti region of Ghana. The nearest city is Kumasi (Ghana's second largest city). Barekuma has a population

of approximately 3,060 where 58.8% of the population are male and 41.2% of the population are female (Amuase, 2011). The economy of the Barekuma community is predominantly agriculturally based with the cultivation of citrus, maize, cassava, yam, cocoyam, ginger, oil palm, rice and cocoa with some domestic animal husbandry (Amuase, 2011). Leaders in Barekuma have expressed fears there could be a food shortage in the community with increasing production of exported crops like cocoa (Demond, 2011).

The people of Barekuma have a rich history. In their culture, the “stool” is an important symbol. Stools serve many functions among the Akan and are used primarily as chairs, but are also objects given at rites of passage. They can be considered sacred objects, and also political symbols (Patton, 1979). In Barekuma, and according to the formalities of acquiring “Customary/Stool Land,” whoever has the stool, (synonymous, in this case, with the American concept of a deed), is the possessor of all the land. The present chief of Barekuma and the Barekese sub-district is Chief Nana Tabiri. He possesses four stools in his stool room belonging to the Akuanang royal family. The stools, blackened by rituals with blood and powdery substances, bear the chief’s name and are arranged in order of succession (Demond, 2011). While other regions also include royal family houses in their political stools, Chief Nana Tabiri’s stools only include land, so he refers to them as “stool land” (Demond, 2011).

Chief Nana Tabiri, as well as other BCCDP members, formulated a plan to allow the Agricultural Cooperative to lease the stool land. This Cooperative would use stool land to grow oranges, which can be sold for profit. As oranges are a crop taking about five years to mature, the idea to intercrop this citrus with corn to offset the immediate costs of the Cooperative was given. The Agricultural Cooperative had the goal of increasing incomes of those who

participated and to be a model for future cooperatives in the Barekese sub-district and in other areas in Ghana, and perhaps other areas of the world.

History of the Agricultural Cooperative

Due to a strike in 2006 in Tema, a shipping port near Accra, traders from Burkina Faso and other neighboring countries began traveling over previously less-used shipping routes to the shipping port of Abidjan, Cote d'Ivoire. This swell in traffic increased the demand for produce (especially oranges) for a short period of time, and a proposal was made to increase the supply of oranges. In 2007 the conflict was resolved, and though demand decreased, the suggestion to produce oranges was still carried out by the BCCDP.

In 2006, a group of young adults in Barekuma formed the Amakye Bare Youth Development Association. At its inception, the objective of this association was to identify and carry out community development projects. Initial projects included the construction of footbridges over the streams and rivers along paths throughout the community (Amuase, 2011). Community leaders identified the opportunity to cultivate an orange grove and approached the association to focus their efforts and undertake the project. The BCCDP became involved in response to a request from the “agriculture group” within the village, which resulted in the BCCDP going to KNUST and creating a partnership with Dr. Kwasi Ohene Yankyera and Brian Rivette. KNUST, with support from the BCCDP sent a team of students to the village to present the cooperative method as an option. The members of the village liked it and the KNUST students returned and helped the group form the cooperative (Rivette, 2011). By 2009, the association was registered as a cooperative by the Cooperative Office of the Atwima Nwabiagya District Assembly, requiring a change of their name to “Amakye-Bare Youth Co-operative

Farming & Marketing Society Limited” commonly known as the Agricultural Cooperative. The membership of the Cooperative fluctuates, but usually contains about 35 members.

When the orange plantation was first proposed, Reagent Chief of Barekuma, Nana Tabiri initially identified an area of land near the village center, but due to delays, another group was given the “lease” on that land (Rivette, 2011). While the term “lease” is sometimes not well understood amongst Ghanaians, it is used in this paper because the land agreements contain a clause that returns the land to the stool owner at the completion of the contract. A five-acre area within the stool land was identified and a contract for sharecropping was developed.

The land agreement identifies the Gyedu Kumanin Stool of which Chief Nana Tabiri of the Akuanang royal family is the “landowner” or possessor. The Amakye Bare Youth Cooperative Farming and Marketing Society Limited, now known as the Agricultural Cooperative, are listed as the “tenant”. There was a “knocking fee” (down payment) of 500 Ghana Cedis, which was paid to Chief Nana Tabiri. As per the contract, the tenant is to clear the land, plant the crops, and develop the citrus trees to the point of maturity. This “development period” is estimated to take four to eight years, during which the tenant bears all the costs incurred. The tenant also provides labor and supplies for the cultivation of the crops and receives all revenues from the proceeds of any sale of crops during the development period. At the end of the development period, the land will be divided equally between tenant and landowner (2.5 acres each) and each party will bear the cost and receive the revenue of their own share of the plantation. The full term of the agreement is 25 years or the life of the citrus trees, whichever is longer, and if the contact is not extended, the land is then returned to the stool possessor.

The Agricultural Cooperative did not have the initial money necessary to pay the knocking fee or to buy citrus trees, maize seed, machetes, Wellington boots, fertilizer, agrochemicals or the spraying machine for fertilizer and agrochemicals. They needed a loan to pursue this project. This created an obstacle, because loans of this kind are not often given. In Ghana, and particularly in this region, many banks have refused to make loans due to a tradition of loan default.

The local culture has viewed loans, in particular funeral loans, as money that can be paid back whenever the recipient feels that he or she has enough money to make the repayment or not at all. This perception persists even if banks stress the consequences and terms of the loans (Rivette, 2011), and are largely derived from important cultural traditions such as a community's emphasis on creating major funerals for the deceased, despite financial restrictions. In addition to an intricate cultural standard of non-repayment, donations and government grants, which have not required repayment, have fed this cultural norm. The infusion of donations from development programs, NGOs, and the International Monetary Fund programs are also compounding this problem because they also do not require repayment (Riddell, 1992).

Faced with the credit shortage, leadership of the BCCDP found an alternative to the current loan method of Ghanaian banks. The Agricultural Cooperative is now funded by a loan managed by the Nwabiagya Rural Bank. All of the money from the loan comes from donations to the University of Utah's Global Health Initiative (GHI). The management method of the loan is called the "on lending" model. An outside party provides the funds and establishes a base interest rate and then the bank charges an additional 5-6%. The market rate for a one-year loan

in this region is 25% for a one-year term. Because the money belongs to the University of Utah, a more favorable rate of 21% for an eight-year term was negotiated, 5% of which is the Nwabiagya Rural Bank's fee for the service they render (Rivette, 2011). Of all the loans the Nwabiagya Rural Bank manages, the loan to the Agricultural Cooperative is the only loan with a term longer than one year and also has the lowest interest rate. As the remaining funds are repaid, they are being put into a "seed fund" for future economic development by the GHI and possibly, the BCCDP (Rivette, 2011).

The Orange Grove

The land on which the orange grove is planted is similar to the shape of an hourglass, with a narrow neck linking two larger sections of the grove. It takes about a half hour by foot to walk from the center of town to the orange grove. The grove totals five acres and about one acre is still not cleared and remains unplanted. The planted trees are hybrid specie developed to withstand many of the common problems the citrus trees have in the region. The cooperative has inter-cropped maize amid the orange trees until the trees mature in about four to eight years (average is five years). The corn provides shade when the trees are young to keep them from over exposure to the sun, and also provides a source of income until the trees produce fruit. One must understand that the harvest of oranges will not occur until the trees are mature enough, though the corn is already producing. Thus, the grove contains about 700 citrus trees and five times that many corn stalks.

After the first harvest of maize, a loan payment was due as per the loan agreement. Instead of using all the proceeds to make a payment on the loan, some cooperative members retained a portion of the proceeds. Due to the complex nature of the loan repayment program,

we hypothesized that Cooperative members had mixed understandings of the proper progression of cooperative goals. We also hypothesized that there would be disparities of knowledge between members and leaders.

Methods

The primary objective of this study was to survey the 35 members of the cooperative regarding perceptions about the partnership of the BCCDP, each partner's responsibility to the project, and perceptions about the loan. John Amuasi of Dr. Daniel Ansong's development team at KATH proposed to conduct this survey after the first loan payment revealed possible issues (see Appendix 1). Prior to departure to Ghana, members of the BCCDP in Utah and Ghana discussed concerns regarding the current state of the Agricultural Cooperative. Following the recommendation of John Amuasi, a survey was developed and refined through email communications with leaders. There was great focus on knowing the opinions and perceptions of each member and leader in the Cooperative. The 46-question survey contained demographic indicator questions, questions about perceptions of partners and the partnership, perceived participation activities, and technical questions of farming. Once in Ghana, several hours were devoted to working with Ghanaian student counterparts to develop a translation of the questions into Twi, the primary language of the Akan.

The population surveyed was the entire Agricultural Cooperative. 8 student researchers surveyed 34 of 35 Agricultural Cooperative members and 2 community leaders; the only cooperative member missed was a man traveling during our time in the village. Survey teams consisted of two students, one KNUST Agricultural Economics masters student and one

University of Utah student. Each survey took approximately an hour and a half to complete. Data analysis included descriptive statistics, analysis of variance, and frequency tables.

The survey was formulated to find perceptions of and other facts about individual Cooperative members which were previously unrecorded. As there are small but constant fluctuations in membership, some BCCDP leaders believed that there were slightly more females than males. Demographic questions of Cooperative members clarified these perceptions.

Written records of meetings have been hard to come by in the survey design, though record keeping has constantly been stressed in Cooperative meetings with the BCCDP. Education level of Cooperative members will be recorded in the survey as a potential reason for a lack of record keeping. As we tried to get an understanding of the Agricultural Cooperative, the Cooperative itself was the least helpful source of information until we were in Ghana and could speak with them directly.

Last year a significant number of orange trees died. Several questions are included to ascertain the reason for so many failed trees. BCCDP members hypothesized the reason for dying trees was due to apathy on the part of the Agricultural Cooperative members, vandalism, improper spraying methods of either herbicide or pesticide, or a lack of technical knowledge. Several questions regarding member proficiency in farming, spraying, and protection were included. Getting deeper into the issue of member farming proficiency, an occupation question identifies the primary and secondary occupation while other questions ask about the number of training meetings attended and years of farming experience. The orange grove is not the primary or even secondary source of income for any of the members, so keeping some of the

money rather than paying off a high interest loan baffled the partners of the BCCDP and provided an additional reason for conducting this research.

CBPR is at the heart of the Agricultural Cooperative's inception, but as members of the Cooperative are not original members of the BCCDP, leaders hypothesized that individual Cooperative members may not know and understand the BCCDP's goals for the Cooperative. To measure Agricultural Member knowledge of the BCCDP, one section is devoted to perceptions of the BCCDP. Questions seek to find if Cooperative members know what the BCCDP is, their perception of BCCDP member's responsibilities, and how well each member of the BCCDP is performing their responsibilities. Further, questions concerning how well BCCDP members are supporting the Cooperative in several key functions like horticultural, financial and legal support.

Loan payments occur at each harvest of maize, as the terms of the loan require. If there is no harvest, no loan payment is due. The land is very fertile and producing corn very well. Some have suggested moving solely to maize, though the long-term goal is for the grove to be orange producing. When the survey was created, the Agricultural Cooperative had made a loan payment, but had held back a portion of the proceeds of the sale of corn. Concerns were raised after the sale of the first crop of maize because the Cooperative members kept nearly half of the proceeds from the sale. BCCDP leaders wanted to investigate this issue. Questions were included to identify monthly income as well as expectations for payment and when those payments were expected.

Understanding how Cooperative members perceived ownership of different portions of the project was also of great interest. The land agreement is a complicated business agreement

and perhaps the first agreement of its kind for many of the Agricultural Cooperative members. It was hypothesized that many members didn't understand the ownership so an open-ended question about ownership of the maize, citrus, and the land is included. Questions were also asked about the amount of the loan and the rate of the loan to identify the extent of knowledge of the specific aspects of the Cooperative's agreement with the bank.

BCCDP leaders hypothesized that with a group of 35 there could be group tension or other group dynamic issues like social loafing, therefore, questions about relationships within the Cooperative were included. We also asked how many hours each person was working in the orchard, as well as monitoring the citrus to find how crops would be protected from animals and thieves. A question was also asked if there is room to add new members to the Cooperative.

Results

The Cooperative has 6 leaders among the 34 members surveyed with positions varying from President to Financial Secretary. A test was performed comparing the relationship of how many leaders versus traditional members of the cooperative know key information regarding the cooperative.

The first question addressed how much being in leadership affected knowledge of key Cooperative information like the total value of the loan. When comparing the breakdown of responses one can see that the mode and median are the same (see Table 1). The wide deviation for members shows their wide range of responses while the leader's responses are very near the actual loan total of 2000 Ghana cedis (see Figure 1). 63% of leaders were either correct or very close to the actual total of the loan. 57% of members were also either correct or

very close to the actual loan total. Though the p value indicates statistical insignificance, the range of confidence intervals and median values are shown to demonstrate the variability of responses.

In regards to the demographic breakdown of the Cooperative, their ethnicities were almost entirely homogeneous with one Northerner and 33 Akan. Ages range from 18 to 51 and the average age is 33. Religious affiliation showed that there were 2 Muslims and 32 Christians. There are 18 Males and 16 Females, which is fewer females than BCCDP leaders previously thought.

The vast majority (20) had a middle school education; two members had secondary education and one had tertiary education. A concern expressed by BCCDP leaders has been a lack of record keeping which could be explained by the educational achievement of the members. We found in interviews and other conversation that there is a general lack of documents and documenting within the cooperative. These results suggest that lack of educational attainment may be the underlying reason for a lack of documentation and record keeping. BCCDP leadership may have to think of alternate means of keeping records. One possible solution is voice recordings. Of the 34 members 24 had reported cell phone numbers on their survey. Where cell phone calls are inexpensive from cell phone to cell phone within Ghana, perhaps a calling and message sending system, whereby members regularly leave a detailed voice recording regarding important information, could be established.

The primary occupation of 23 of the Cooperative is farming. 100% of leaders were farmers as either their first or second occupation. With this much institutional knowledge, issues pertaining to the maize and citrus should be in good hands. Additional survey questions

revealed that eight members had five plus years of experience growing citrus, one member had 1-2 years experience, and 11 members had intercropping experience. This question about intercropping was intended to inquire about experience prior to working with the Agricultural Cooperative, but where more people had intercropping experience than experience growing citrus; there may have been an error here.

When asked if they had heard of the Barekuma Collaborative Community Development Project, 32 of 34 acknowledged they had heard of the BCCDP. Following this question, several open-ended questions were asked as to whom the respondent saw as members of the BCCDP. Utah was mentioned most (24), then Cooperative (16), KATH (15), Dr. Ansong (8), KNUST (8), Assemblymen (7), Chief (6), other (6), and Community (4). The answers to this question may have been influenced by the fact that the University of Utah students were present when the surveys were conducted. In addition to their presence, many of the students wore University of Utah t-shirts, which were given as a gift to University of Utah and KNUST students and leaders. This potential Hawthorne Effect (Landsberger, 1958) may have even influenced how little KNUST was included as a response. Perhaps if the University of Utah students and the KNUST students had all worn KNUST labeled t-shirts, KNUST would have been more widely recognized as a participant in the BCCDP.

When asked the role of the Cooperative in the BCCDP orange plantation project, 31/34 said labor, which is good because the members' role is to work on the orchard, protect the harvest, and meet together for training and work assignments. When asked if the Agricultural Cooperative of the BCCDP is a means of improving livelihood, 31 of 34 said yes.

A series of questions about the ownership of different parts of the Cooperative were also asked. In an open-ended question about ownership of the citrus, 30 mentioned the cooperative and 12 mentioned the community, which is good because they do own the citrus. In an open-ended question about ownership of the maize, 31 mentioned the cooperative 5 mentioned the community, which would suggest that the cooperative uses the proceeds from selling the maize for the proper purposes. When asked about the ownership of the land, 17 mentioned the chief, 12 mentioned the community, and 13 mentioned the cooperative. This is in agreement with our hypothesis that there would be mixed understanding of the land ownership. The perceptions of ownership of the maize and citrus are correct, though the land does belong to the chief.

When asked what they expect to receive in return for their contribution of labor, common themes reported were rewards, money, or citrus. Expectation of receipt of payment would not occur until the citrus trees were producing fruit, according to 12 members. When asked if compensation received was satisfactory, 18 said yes, and 15 said they had not yet received compensation. Again, the responses to this question may have been influenced by the presence of the researchers.

A troubling result revealed by the survey is that some members have received some compensation. In audio minutes of a meeting with a BCCDP leader the first loan payment is discussed in great detail. There were issues with the payment being smaller than the total proceeds of the sale because some money from the first sale was held back. There may be some financial mismanagement going on here, and more investigation was done as to where

half of the proceeds from the first sale went and why it wasn't distributed to at least 15 of the 34 members.

This issue was raised among leadership of the BCCDP and further information was revealed. The proceeds which were held back were used to feed people who harvested the corn as they were working. So those who said they had not been compensated might not have seen that as compensation, or worked on the harvest, and those who said they had received compensation may have seen the food while working as compensatory.

100% of members felt they are in partnership with the others in the cooperative. This perception is good, because in other community based projects, dissension can arise between communities and researchers (de Schweinitz et al., 2009). 26/34 (76%) felt KATH was fulfilling their duty, 55% said yes to KNUST fulfilling their duty, while 29% said they were unsure, and Utah fared as well as KATH with 76%. I think that there may be some confusion about Dr. Ansong and whether he works for KATH and/or KNUST. In a future intervention, more could be done to explain to the community and the Cooperative what the goals are for the BCCDP, who is involved, and their respective duties.

When asked about which groups contributed to the Agricultural Cooperative project, 18 mentioned that Utah is involved in the finances of the loan; KATH's role was seen to be in giving motivation, support, and advice. Seven members said they didn't know KNUST's role, while others identified themes such as education on marketing and sales techniques. Some mentioned the district offices and training sessions they provide. As it seems to be widely known that the loan came from money the University of Utah is lending through Nwabiagya Rural Bank, special care needs to be used to ensure the loan is understood as a loan and not a

donation. University of Utah, KATH, and KNUST partners could all improve the community and Cooperative's understanding of their responsibilities within this research collaborative.

Within the Agricultural Cooperative, relationships with other members is either cordial (45%) or very cordial (55%), which is great because often group membership or group work can be strained (Paul, 1987). Good group relationships may be the result of near equal division of labor hours. The labor hours question was poorly written. The results show everyone working more than 7 hours but this inaccurate response suggests that everyone is working many hours. In some cases, interviewers didn't collect a number when it was more than 7, but the answers also varied based on the time of year they considered. If this question is asked again, growing season, harvest season and idle times should be considered. Everyone said there is room to add new members, especially to help with laboring in the grove.

When asked questions of crop security, responses varied and indicated that the Cooperative occasionally monitors the grove. Researchers wonder if everyone thinks someone else is doing the work, but no one is truly doing enough work to keep the crops safe. 94% say that their monitoring habits haven't changed since the destruction of 400 trees (which have since been replanted). When asked about citrus security, the activities members participate in were spraying, weeding, fertilizing, without mention of theft or other human problems. When the citrus trees produce fruit, members said security activities will be similar to what they are now. Some members did, however, mention problems of future theft by humans. In this region, big mammals are not likely to go and eat the citrus. The largest animals seen were miniature goats, which seem to subsist on food waste within the community and are unlikely to venture the distance to the citrus grove and couldn't even reach much of the crops if they did.

The last topic of the survey addressed monthly income. In our translation meeting with our Ghanaian counterparts, this question consumed the most time for translation. It was the general consensus among the group that farmers wouldn't know their monthly income, but that it could be generated through a series of simple math questions breaking down the month into weeks or days and then multiplying to get to a product of monthly income. Despite best efforts, we still had one Ghanaian student who didn't ask this question to any of the respondents they questioned. We collected monthly income from only 23 of 34 respondents. The average monthly income was 369.65 Ghana Cedis per month, which is about 225 dollars per month. If the two highest and two lowest are eliminated, the new average is 222.26 Ghana Cedis, or about 135 dollars per month.

Discussion

This research was done with the view that a follow up intervention based on the results would be given in the summer of 2012. Themes to be discussed include shareholder rights, terms of the loan, level of commitment, KNUST's role, record keeping, availability of funds, and land ownership.

Currently the Agricultural Cooperative is a registered cooperative and receives technical support from the district offices. The technical support comes in the form of trainings and provides a source of advice for matters relating to cooperatives. As a registered entity, the Agricultural Cooperative has articles of incorporation. Researchers on this team have not seen those articles but they have been seen by leaders in the BCCDP.

One interesting aspect of the Cooperative is its ownership clause. There is a fee to join the Cooperative in addition to yearly dues and work hour requirements. Currently, 35 shares are owned, one share by each member of the Cooperative. Theoretically, people can own more than 1 share, and could own shares without providing manual labor if they offset labor requirements with higher dues. Questions measuring the understanding of shares of the Cooperative were not asked as this situation wasn't explained until the group was in Ghana. Greater understanding of this issue would help Cooperative members make educated investment decisions. This shareholding concept, however, may be difficult for those with less education to understand. It is also possible that those with a better understanding of the concept would take advantage of those whose understanding is lacking. Therefore, the need for better understanding of this aspect of the Cooperative among the members is crucial as the perception among all members is that there is room to grow and also a need to grow. If the Agricultural Cooperative is to increase in membership, they need to agree on the joining process and the consequences of growth and prosperity.

Another matter needing clarification for all members is the terms of the loan, including the interest rate and loan amount. It is also possible that since the majority of respondents indicated a loan amount of 2000 Ghana Cedis, that members are unaware of additional credit available to them. The actual loan amount was 5000 US dollars, and they have only used 2000 US dollars. The current exchange rate is more favorable now than when the loan was initially made, therefore 3000 remaining US dollars would equal about 4900 Ghana Cedis. Conversations with members after the survey process indicated a desire to expand and cultivate the undeveloped portion of the Orange Grove. There is also a need for irrigation for

areas with greater incline where water runs off and citrus trees and corn stalks are being scorched by the sun. The additional 4900 Ghana Cedis available would provide the opportunity to accomplish these group goals.

One oversight of the survey was that commitment level to the Cooperative was not addressed. The Amakye Bare Youth Development Association was founded to improve the community, not their own individual livelihood. When they transitioned to become the Agricultural Cooperative, opportunities to improve their individual circumstances may have influenced their original goal of community improvement. They had previously been volunteers and received recognition within the community and satisfaction for a job well done. Now, their outcomes are greater income levels and might not provide the same satisfaction level as when they answered to the community. Therefore, their change in mission may have implications to the commitment level of each member to the new goals placed upon them. In theoretical terms, the group may be experiencing mission creep.

Additional problems with recognition include the role KNUST has played in the Agricultural Cooperative development. In fact, KNUST fared the worst for recognition in the survey. The role members of the BCCDP play needs to be explained better to the Agricultural Cooperative members. Even the University of Utah members give the perception that they could provide money for future projects when in actuality, their first responsibility is actually research, and the additional money available to the Agricultural Cooperative has already been made available through the Nwabiagya Rural Bank.

Another concern lies with the inadequate record keeping method. Future methods could include the utilization of a calling tree to disseminate information among all members as

the vast majority of the Cooperative members have cell phones. Additionally, those with higher education could be tasked with note taking at group meetings and further information dissemination to less-educated members and those without cell phones.

The BCCDP should also reiterate the ownership of the different parts of the Agricultural Cooperative. It needs to be understood that the Chief owns the land, but has leased it to the Cooperative. Proceeds from the sale of maize are to be used by the Cooperative to pay back the loan. Proceeds from the citrus belong to both the Chief and the Cooperative because by the time the trees are producing fruit, they will need to divide the plantation into equal parts. After 25 years or when the citrus trees die, the contract ends and the land then belongs to the Chief. Understanding these essential concepts will help the Cooperative be more successful in their entrepreneurial efforts.

Conclusion

Results from our survey indicate that many members of the cooperative lack an understanding of information regarding ownership, loan terms, and BCCDP expectations. There is reason to be optimistic, however, because many members of the Cooperative understand and are performing their roles. Therefore, the intervention next year will have few perceptions to improve upon. There has been substantial success the cooperative members have achieved in adopting the practices of a cooperative effort, of which model may prove beneficial to other communities in Ghana and the rest of the underdeveloped world. As understanding increases of available credit, the project may become more effective as irrigation systems are developed and the full allotment of land has been cultivated. Following the given recommendations, the Agricultural Cooperative can create a more cohesive operation and maximize profits.

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Table 1: Descriptive Statistics of Agricultural Cooperative's perceptions of loan amount.

	<i>Leader</i>	<i>Member</i>
Mean	2100	1962.5
Median	2000	2000
Mode	2000	2000
Standard Deviation	223.6068	532.7601
Range	500	2800
Minimum	2000	200
Maximum	2500	3000
Count	5	16

Figure 1: Status in Agricultural Cooperative; Least Squared Means



Appendix 1: Farm Revenue and Expenditure Accounts (provided by John Amuase)

Income Statement of BCCDP Agricultural Cooperative 5-acre Major Season Maize Project 2009

Farm Expenses		Farm Income	
Item	Value(GHS)	Item	Value (GHS)
**Fixed Variables		Sales of Produce	550.00
Land	33.33		
Machetes	6.00		
Spraying machine	13.33		
Wellington boots	9.33		
Non-Fixed variables			
Fertilizer	320.00		
***Seed maize	40.00		
***Agrochemicals	140.00		
Farm Operations			
Land clearing	90.00		
*Tree felling	50.00		
Planting of maize	60.00		
Fertilizer/ herbicide application	60.00		
Maize harvesting	30.00		
*Carting of Maize to house	30.00		
De-husking of Maize	30.00		
*Shelling of maize	35.00		
Total	947.00		
Net balance =			-397.00

** Expenditure on non-food item*

***Depreciation on the items for the 1st year using sum-of-the-years-digit method*

****Half the cost bought for the 2 farming seasons in 2009*

Appendix 2: Land Agreement between Chief Nana Tabiri and the Agricultural Cooperative

Agreement on Land Transfer on Sharecropping Basis Barekuma, Atwima Nwabiagya 30 March 2009

Parties to the agreement:

Landowner: Gyedu Kumanin Stools

Tenant: Amakye Bare Youth Co-operative Farming and Marketing Society Limited

Down payment ("knocking fee"): Five hundred Gh cedes (GH¢ 500), for five (5) acres of land.

Tenant responsibility: Clear the land, plant the crops and develop the citrus trees to the point of maturity. All costs and revenues incurred during the development period (four years from the initial planting of the citrus) will be borne and received by the tenant. Tenant must provide all labor, necessary supplies and cultivation to develop the Orange trees to the point of maturity. All revenues from intercropping or early citrus yield during the first ~~four~~ ^{eight (8)} years are to be received and held by the tenant.

Upon the end of the fourth year, the mature citrus plantation will be divided between the parties, equally (50% to each party). Thus, each party will own during the term of this agreement, two and a half acres (2.5 acres) of land with mature citrus trees. All costs and revenues associated with the mature citrus crop, from the fourth year forward, will go to each party based on their ownership.

Term of the agreement: This agreement will exist for twenty five (25) year or the lifespan of the citrus trees, whichever is longer. At the end of this agreement both parties will have the option to renew the agreement at terms to be determined jointly at that time.

Landholder acknowledges that there are no outstanding claims against this land, including any form of litigation.

Signatories to this agreement:


Landowner: Gyedu Kumanin Stools
 **APPIAH ROBERT**
Tenant: Amakye Bare Youth Co-operative Farming and Marketing Society Limited

Regent Chief Nana Kwasi Tabiri
Witness  **OFORI KENE**
Date: **20/3/09** **STEPHEN**



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